SYNCHRO—SETTE

THE SUBCRIPTION MAGAZINE FOR THE SINCLAIR ZX-81 / TS-1000 MICRO COMPUTERS

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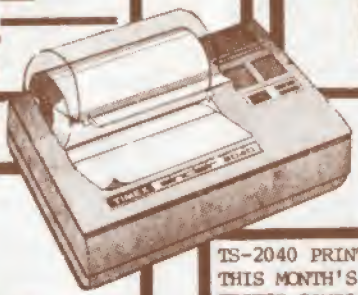
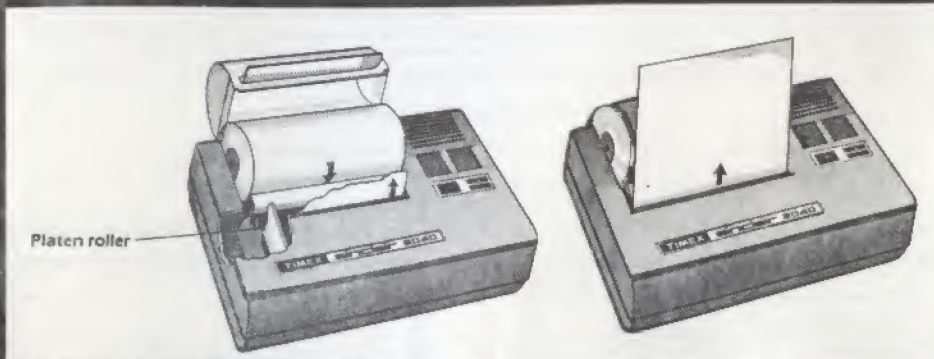


The TIMEX 2040 PRINTER



First let me say that I have never been so impressed by any printer in this price range ($100.00). My first impression before seeing the 2040 was that it was going to be the U.S. version of the ZX printer - not so! It is a thermal printer like the ZX but that's where the similarity ends.

The 2040 is about twice as big and is constructed from tough ABS plastic. It weighs about 3 times as much and is much quieter than the ZX. Don't get me wrong. The ZX is worth about a hundred bucks but then any computer printer that gives readable copy in today's market is worth about that. The 2040 gives you much more for your money. It is directly compatible with the TS/ZX machines and require no POKE routines to make the COPY, LPRINT or LLIST commands work like some other thermal printers do. It is also extremely quite.

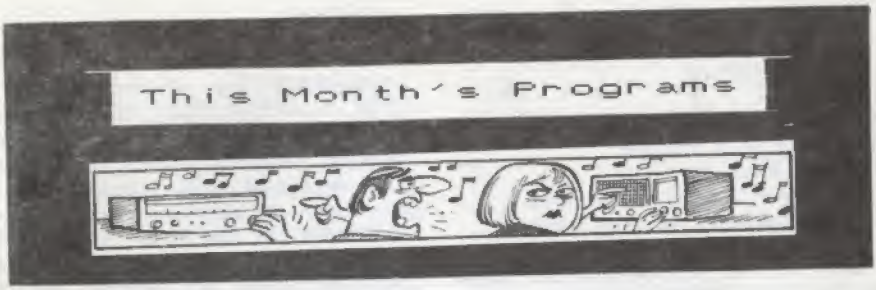
The most important quality of the printer, in my opinion, is the paper and print quality. The paper is gloss white. That's right, not the grey paper that has become a standard on most printers. For those of you that have seen the white paper, you probably noticed that the printed characters are blue on the white background. Not so with this paper - they are black. At first glance the printed copy looks like it came from an ink-cartridge dot-matrix printer on expensive enamel paper. The print density gives the appearance of a weak ribbon but it is still much better than any other thermal printer I have seen. The black on white contrast is superb.

Did you ever have something on your screen that you wished you had a copy of? No problem - just break the program and press the Z key. The entire screen will be copied on paper, graphics and all.

How about one of those programs that keeps scrolling information from the bottom of the screen and then it disappears off the top before you can comprehend what's going on? No problem again - just find the lines in the program that PRINT to the screen. Edit the line number to, say, a number before or after the original line number and change the PRINT to LPRINT in the line. Do this for each of the lines (you might want to add some additional LPRINT lines for separation spacing of the print-out) and you now have a program with hard-copy capabilities.

The user could even print name & address information, cut out the info into mailing labels, and, with a glue stick, affix them to envelopes. Not super professional

(cont. page 26)



There are 8 programs on this montn's cassette not counting the LOADER program.

LOADER - 2K
LOGARITHMS - 2K
GRAFIT - 2K
GUESS IT - 2K
PAINT BRUSH - 2K
MEASUREMENT CONVERSON - 16K
TORPEDO - 16K
BABY SYNTEXT - 16K
BULLETIN - 16K

Each program is recorded only once on each side of the cassette. The first programs that can be LOADed will be of the small size followed by the larger sized programs. For example, this month's cassette has the first to fourth programs recorded as 2K programs. The 5th to 8th programs are 16K. The other side of the cassette is a duplicate of the first side.

For you new subscribers who aren't familiar with LOADing procedures for cassette programs, follow these directions:

A - Make sure that the volume setting of the recorder is set at about 80 % maximum.

B - If you have a Bass and/or Treble control on the recorder, make sure the Treble is at maximum and the Bass is at minimum.

C - To LOAD the first program, type in LOAD "" and press the ENTER key on the computer. Then press the PLAY button of the recorder. The lead time on the APR/83 cassette is about 10 seconds until the first program begins.

The time needed to load the LOADER program is 39 seconds. When the program is loaded, a list of this month's programs will appear automatically.

Shut off the recorder when the LOADER program is loaded. Any of the listed programs can now be loaded into the computer by pressing the appropriate number on the keyboard and then pressing the PLAY key on the recorder. The loader program loads the program by searching for the name of the program you want and ignoring any of the other programs it may encounter along the way.

If you want to go directly to a program without waiting, we suggest you first find the tape location of the beginning of each of the programs with your recorder counter. This can be done as you go through the programs the first time, noting the tape location on the counter as each one is being loaded.

If you don't have a counter, approximate the tape position with the fast forward key just before where the program would start and then LOAD the program with the name of the program using the format LOAD "NAME OF PROGRAM".

Some of our subscribers have told us that they could not get the programs to load by name but they would load with the double quotes. Others have told us that the loader program wouldn't load certain programs. Most have told us that all the programs could be loaded either way. Every customer's cassette is made from the same master tape so the programs on everyone's cassettes are identical. We feel it is most

probably a problem of volume adjustment or recorder design. We have noticed this situation on some of our recorders.

PROGRAMS (all programs this month are self running except "GUESS IT".
- program's name has inverse last character if self running
RT = run time/LT = load time)
There is an approximate 7 to 20 second pause between programs

(LOADER 6-23)

1 - "LOGARITHMS" LT = :11 24-30

We have been brought up to learn the number system to the base 10. A number such as 100 to the base 10 would have a logarithm of 2 or would be 10 to the power of 2. 1000 would be 10 to the power of 3 so its logarithm to the base 10 would be 3.

This program asks for the logarithmetric base of the number and then the number itself and then gives the logarithm to that base. Base 2 with a number of 16 would give a logarithm of 4 because 16 is 2 to the 4th power. Decimal fractions of both numbers and bases are allowed but only decimal representations of numbers are allowed. In other words, the numbers to have their logarithms found and the bases must be entered as decimal and not with other numbering systems such as hexidecimal, binary or octal.

2 - "GRAFIT" LT = :20 31-40

After this program loads, the screen will go blank for a few moments. This program comes with sample data for demonstration purposes.

To enter your own data, RUN the program and enter 12 data values such as monthly sales figures. The program will automatically use the largest value for the longest graph line and the other values will be plotted proportionally. Total sales and average monthly sales will be calculated.

This routine could be incorporated into another program to give a screen graph representation of sales, say from a customer invoice program. Since the first line starts at 9000, one might want to write a program around it and eliminate the INPUTs in lines 9070 and 9110 and also the DIMs in line 9000 and 9010 and change the 12 limit in line 9040. The user, of course, would have to have these values and variables generated at some other part of the program.

3 - "GUESS IT" LT = :32 41-54

This program is not self-running so you are going to have to enter RUN. It also uses all the memory space in a 2K machine and may operate erratically unless a 16K RAMpack is attached.

It is a 2 player game that is based on the old Concentration concept. The players try to match the graphic characters under the question marks, 2 at a time. Each time a match is made, that player's score is increased by 1 and those spaces are left blank. The game is continued until all the question marks are gone.

4 - "PAINT BRUSH" LT = :35 55-69

Here is a program, similar to our ARTIST program. The blinking cursor can be moved in 8 directions by pressing the following keys:

```
                  up
up-left <Q>       <W>          <E>
up-right
left    <A>                    <D>
right
dn-left <Z>       <X>          <C>
dn-right
                 down
```

The cursor will print on the screen whatever character is blinking inside it. To change the character, press the <S> key. The <L> cursor will appear at the bottom

of the screen and you can now enter one character and then press ENTER.

If you want a graphic or inverse character, press SHIFT <0> to get the <G> cursor at the bottom of the screen. Now enter the graphic or inverse character you want and press SHIFT <0> again and then the ENTER key.

As the cursor moves, it will leave a trail of characters like the one blinking. To erase, press <S> and then ENTER a blank space. Be careful not to go past the edge of the screen because the program will bomb.

To save the picture on tape, press the <K> key and then type in a file name. Prepare your recorder and start it in the recording mode. Then press the ENTER key and the program with the picture will be saved.

If you have a graphics printer such as the TS-2040, you can print the screen by breaking the program and then pressing the <Z> key. Your picture cannot be recovered if you do this so it is a good idea to save it on tape first if you feel you'll need it again.

5 - "MEASUREMENT CONVERSION" LT = 2:28 70-119

Ever wonder how many teaspoons in a gallon? How about how many grams in a ton?

The opening menu asks the user to select one of the conversion categories. The user will be then asked to input the amount of items to be converted and then all the applicable items will be displayed in converted amounts. Press ENTER to return to the menu.

6 - " TORPEDO" LT = :56 120-139

We tell people we bought our computer because we can do everything from balancing our checkbooks to planning our shopping list. The real reason, though, is so that we can play games, right?

After you enter your name, a submarine will travel across the top of the screen. Your ship is hidden under the lower-left corner of the screen. You can fire torpedoes at the submarine by pressing the number keys between 3 and 8. These keys represent the angle the torpedo will be fired at from 30 to 80 degrees from that corner.

You have to try to aim for the radar dish on the submarine in order to sink it. If you hit it, the submarine will explode and sink to the bottom of the screen. If you miss, the key you pressed won't work for the next shot. As a matter of fact, it won't work on the next shot even if you hit the submarine. In other words, you can't use the same angle number for 2 shots in a row.

Each player gets a number of submarines and torpedoes that total 20 between them and a score is figured after each game with high score and player displayed also.

(Refer to November 83)

7 - "BABY SYNTEXT" LT = 2:34 140-185

This is actually a mini-version of our new SYNTEXT word processor.

This program is designed to allow the user to enter and edit text. It is written entirely in BASIC and yet has almost the speed of machine language.

It is suggested to the user to insert routines such as word searching and replacing, page numbering and block-movement. Printing of the screen can be accomplished by breaking the program and pressing the <Z> key and then the ENTER key for the printout. Entering GOTO 300 will bring back the text to its original condition.

The program will appear on the screen after a few minutes with some instructions. This is actually entered text.

To remove this or any text, BREAK the program and RUN it. SHIFT H will

bring the HELP MENU any time you need it.

TEXT SIZE:

The program will allow input of up to 88 thirty two character lines of text. This comes out to be four screen "pages".

When a key is pressed, the screen will flash and the character will be entered into the position where the cursor was and the cursor will move to the next position to the right. If a character already occupied the cursor position, it will be replaced by the new character.

The computer is in the SLOW mode when the cursor is blinking. When a key is pressed, it enters the FAST mode, places the character on the screen and returns to the SLOW mode. This causes the screen to momentarily flash. If you find this offensive, BREAK the program and remove line <103 FAST>. The text entry will now always be slow (use GOTO 300 to return). I personally have found that the fast mode is easier because the user can observe the keys and easily notice the screen flashing, which indicates the successful entry of a character or space. This way the user can pretty much observe the keyboard without having to look at the screen too much, which helps speed up text entry. It also makes the program operate about 4 times faster than in the SLOW mode.

DO NOT USE THE <BREAK KEY> WHEN IN THE TEXT ENTERING MODE.

If you use the SHIFT key with some of the other keys where a command that has more than one character is introduced, the program will break and the following recovery methods will not work, so - DO NOT USE THE SHIFT KEY WITH ANY OTHER KEY UNLESS ALLOWED BY THE <HELP MENU> WHILE IN THE TEXT ENTERING MODE. If, perchance, this happens, the following should aid recovery:

Type in <LET A$ (B-1) = " "> and then <GOTO 300>.

Otherwise, if you make a mistake, text MAY be recovered by entering <GOTO 300> for the last cursor position or <GOTO 20> for the CURSOR HOME (beginning of text) position.

You will notice that after the program is loaded you see sample text on the screen. You will notice that the cursor blinks over the character or space it is currently at without removing any of the occupied characters.

Whenever you need to review the commands, go to the HELP menu by pressing <SHIFT H>. This is a tremendous convenience because you can do this at any time you are in the text mode. Pressing the ENTER key will return the text to the screen.

CURSOR MOVEMENT:

The cursor is controlled by using the SHIFT ARROW keys for up, down and sideways movement. When the cursor reaches the bottom of the screen and a command is used to go to the next line down, the text will automatically shift up one line. When the cursor is at the top of the screen and a command is used that would bring the cursor to a line above, the text will automatically shift down one line.

The rest of the command controls are as follows:

TEXT COMMANDS:

SHIFT (B) - brings the cursor to the beginning of the text.

SHIFT (N) - brings the cursor to the end of the text on the screen.

SHIFT (Y) - brings the cursor 8 positions to the right.

SHIFT (T) - deletes all text to the right of the cursor in that line.

SHIFT (I) - inserts one blank space to right of cursor and shifts

remainder of text to right.(*)

SHIFT (D) - deletes character or space to right of cursor and pulls remainder of text to left.

SHIFT (H) - HELP menu - where you are now.

SHIFT (S) - SAVEs text on tape with name prompt.

ENTER KEY - carriage return

* If any text is in the 88th line when these commands are used, portions or all may be deleted as the right-most characters get pushed out.

SAVING TEXT (SHIFT <S>)

The SHIFT (S) mode asks the user to enter a name for the file that you want to call the text. When you are at this point, enter a name but DON'T PRESS THE ENTER KEY until a blank data file tape is in the recorder and it is running in the recording mode. After the file is saved, the text will return to the screen with the blinking cursor.

Author's note:

Although this program is not written in machine language, the speed is comparable. It could have some additional features such as block movement and deletion and also word and paragraph counting, page numbering, etc., but we felt this would occupy too much memory and would limit the amount of text that could be entered. All in all it is a very powerful and easy to use program.

Some useful hints are:

- if you want to insert a block of text in existing text, use the SHIFT (I) command by holding down both keys to create a gap large enough for the block to be inserted. The task of deleting the remaining unneeded blank spaces after the text is inserted can be accomplished by using the SHIFT (D).

- if you want to replace a character with a blank space, the SHIFT RIGHT ARROW won't do it. First delete the character and then insert a blank space.

- if you want formatted printout, see the article on the SYNTEXT program.

8 - "BULLETIN" LT = 3:26/RT = 21:36

185-240

Our bi-monthly bulletin board program. Press any key except BREAK to stop the scrolling message. Do it again to restart the message. If the program is stopped with the BREAK key, it can be restarted by entering GOTO 0.

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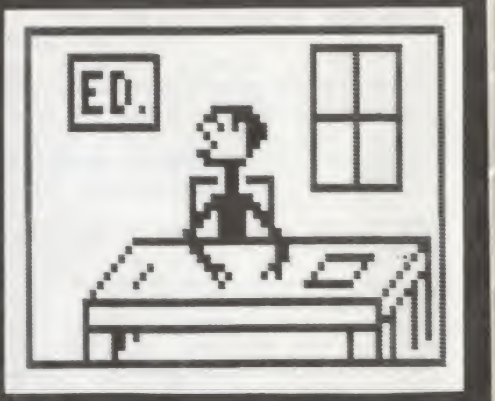
EDITOR RAMBLINGS



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DIGITALIZER/SUPER WINKY

We experienced a breakdown of our in-house cassette duplicating equipment. For two weeks we tried, ourselves, to repair it with no success. The services of Bill (WINKY BOARD) Russell of G. Russell Electronics and also EULYN Electronics were solicited.

Bill worked feverishly to develop for us a prototype SUPER-WINKY BOARD with 10 cassette outputs. The device worked well enough to produce the type of recorded sound quality needed for commercial duplication on a small scale. The output volume of a recorded cassette was just slightly lower than a one on one situation with the WINKY BOARD 2 which is designed to hook up one output recorder to.

Bill called me on the phone to discuss the performance and should be developing soon an improved version that will be available to the public. The new version will not allow a defective recorder to back-feed glitches into the other recorders - a problem that was hard to pin-point with the equipment I was using. It will sell for under $75.00 and like the WB-2, requires no power source. We'll let you know when it is available.

EULYN Electronics has a more powerful device that was designed specifically for us, called the DIGITALIZER. It is also more expensive but will also be available to the public.

The DIGITALIZER has the potential to make from one to 50 copies at a time (possibly up to 100 but that's pushing it, a spokesperson said). Here's how it works! Three items are needed:

1. The CD-1 DIGITALIZER unit allows the master cassette player to be connected through an input jack and has 10 output jacks for slave (duplicating) recorders. It also has another output jack for a CD-2 unit. It has computer pulse-regenerating circuitry geared to the Timex computer and a pre-amplifier that is controlled by a single adjustable volume output to all of the slave recorders. There is a HIGH/LOW LED readout indicator that shows when a program is passing through along with a sound-producing transducer for audio tracking. It is powered by either a 9VDC battery (not included) or has an input jack for power from the CD-3 unit.

2. The CD-2 MULTI-PLEXER unit has output jacks for 10 more slave recorders and an output jack for another CD-2 unit. The units can be piggy-backed to each other from the CD-1. Both the CD-1 and CD-2 units come with cable harnesses to allow

connection of 10 slave recorders to each unit.

3. The CD-3 POWER-PAK unit has a NI-CAD power supply, DC status meter and various control switches and input/output jacks and is used along with a ZX-81 or TS-1000 to make master tapes.

The CD-1 and from one to 10 quality tape recorders is all that is needed to make duplicate tapes but to make quality master tapes and up to 50 copies at a time, a person would need one CD-1, 4 CD-2s and 1 CD-3. The prices are as follows:

CD-1 DIGITALIZER	169.95
CD-2 MULTI-PLEXER	39.95
CD-3 POWER-PAK	99.95

Suggested tape recorders are the General Electric 3-5158 ($51.95) for the master recorder and the Radio Shack CTR-81 ($59.95) for slaves.

A minimum configuration system would require two tape recorders and the DIGITALIZER.

A maximum (50 recorder) configuration system would cost $429.70 for the CD equipment plus the cost of the recorders. Call or write us for further specifics as EULYN Electronics will be marketing them through us.

Also, look for a cheap direct hookup, non-RS232 telephone modem for the, ZX/TS computers soon.

We are now using the DIGITALIZER CD equipment for making our own software (not the bi-monthly subscription tapes - there are just too many to make).

.....

BOSS TAPES DELAYED

If you ordered any of the BOSS series of program tapes and did not receive them, you are not alone. The only ones that have been sent were the single orders of the Word Processing Package #007. This situation was propagated by the breakdown of our duplicating equipment for two weeks and the erratic performance of that equipment before that time. The combination of checking each tape along with trying to repair the equipment left us little time to develop the master tapes for the BOSS program tapes. The duplicating problem has now been eliminated with the use of the DIGITALIZER recording equipment.

The subscription tapes you receive are produced for us by another company but all other tapes will be made on our new equipment. One noticeable improvement will be that the output volume of the duplicated tapes will be higher than those produced by the old method. This, we have found, along with the pulse regenerating circuitry, gives less chance for dropouts. We took ten old tapes that we could not record any programs on because of extreme dropouts and recorded programs on them with the DIGITALIZER. Every one came out perfect with absolutely no indication of dropouts. The device, because of the pre-amplifier, powers the signals onto the tape at a higher volume, despite the condenser microphone circuitry in each slave recorder which normally limits the recorded volume on the tape.

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TS-1000 FOR 39.95

Some of the chain stores have recently had sales where with the $15.00 rebate from TIMEX, the consumer ends up paying $39.95, or in some cases even less.

The lowest I have seen the TS RAMpacks sell for was also $39.95.

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MUSIC FROM YOUR TS/ZX

VIRTUOSO is a music synthesis program on standard cassette for the TS-1000/ZX-81 with a minimum of 2K RAM. It features a 10 octave range, 150 note length, whole to 32nd and dotted notes & rests. It self-performs songs at any tempo through TV, amplifier or AM radio

and can be saved for later use. Instructions include coding from written music for non-musicians . $6.95 no p&h in U.S. W.D. Maples, Dept. T, 688 Moore St., Lakewood, CO, 80215.

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THE PEOPLE'S COMPUTER

The following is an exerpt from a letter received from one of your fellow subscribers who started his own business:

"You probably don't remember me. I was there last year when you were first starting SYNCHRO-SETTE. While we were talking, the name "people's computer" came up several times. That name always stuck in the back of my mind and around the first of the year, I decided to open up a mail-order computer business for Sinclair computers and I took the name.

So, if you want to take credit, feel free. I have placed ads in various publications and my policy will be quick shipment of people's orders and if we are out of stock on any items, the customer will be notified of the expected time of delay.

The main reason I decided to do this is that I myself got sick of waiting for months for an order and never hearing anything from the company.

Sincerely,
Arthur Chana"

What Arthur is referring to is a conversation we had in May of 1982 regarding certain products that are accepted and popularized by the general public and sold more compared to those of the competition.

To name a few, the MODEL T FORD and later the VOLKSWAGEN were considered the people's cars. After World War 2, the Frigidare refrigerator was called the FRIDGE and was the peoples refrigerator. How many among us have asked for a COKE? After the War (WW 2), women used give their hair a TONI.

I told Mr. Chana at that time, that I believed, not the ZX81, but the U.S. version of the SPECTRUM would become the people's computer. My feelings for this were based on the specifications of the unit along with the projected price but most important, the fast data storage devices called "microdrives". Now that Timex has taken over the marketing of the U.S. through major chain stores, I am even more convinced of this occurring.

Most analysts, and Timex themselves, state sales of the TS-1000 machines, since introduction, have been from 600,000 to 900,000 units since the unit was first introduced about 6 months ago. One analyst, whose job is to compile statistics on resale electronics items through the major chain stores, told me that over four million TS-1000s were sold in the first four months.

Let us consider the drawbacks to the TS-1000s and ZX-81s compared to most other computers:

- data storage of variables, separate from the main program is impossible unless a machine code program is used to facilitate the separation, like the one being sold from Cosmonics.

- string variables are limited to 26 because of the BASIC interpreter only being able to identify a single alphabetic character in the variable as opposed to most other computers identifying 2 characters which gives the potential possibility of 26 X 26 potential string variables.

- string variables must be dimensionalized to the length of the maximum length string of characters. This means that each string variable that has a shorter string of characters also has blank spaces that use up memory. In an array of data, a substantial amount of memory space is lost.

- the 64 by 44 screen pixel resolution is about 1/4th what many other computers have.

- the slow computation time of the CPU while in the SLOW mode may necessitate going into the FAST mode. When in the FAST mode, the screen display is lost.

- the keyboard is membrane causing the user to lose the tactile feel of the keys which creates a situation of the eyes constantly moving from the keyboard to the screen for visual verification of data entry.

- the 16K RAMpack and related buss connector are poorly designed in regard to a positive electrical connection causing programs to be lost (crash) for no apparent reason.

- the 32 character per line format is less than any popular-selling computer except the VIC-20 which is 22 characters per line and not counting the LCD display computers.

- the lack of high-speed data storage and retrieval devices from either Sinclair or Timex.

- the slow key-response time, even in the FAST mode, as compared with other computers.

Many of these problems (not all) will be solved or improved with the coming of the TS-2000 and even the TS-1500.

But even with these drawbacks, look how many ZX-81s and TS-1000s have been sold! My estimate, to date, is over three and one half million in the U.S.

Why? Price and single keystroke entry of commands are the main reason.

When the TS-2000 becomes available, we will see an under $200 computer, with, for the most part, full business capabilities.

The following is a copy of an older ad from Mr. Chana's company. He says that there are some price changes since in the Memotech products:

A10-The Sidney Telegraph, Sidney, Neb., Friday, February 25

A snail travels at the rate of .003 miles per hour.

(CASSETTE PROBLEMS CONT.)

I. make a notation, on the cassette case itself, of the volume level for future reference.

J. at this point, the volume level is set as good as it can be. Hit the BREAK key, rewind the tape and reload it in the normal fashion. The program should now load OK unless other problems such as dropouts, distortion or wavering exist.

The computer itself can be a source of problems, particularly the earlier kit models. Weak solder joints by the builder were a common cause of erratic performance.

Good luck!

the Computer Tutor

LINE RENUMBERING

Good morning class, I'm the substitute teacher and I'll be helping to fill in for the Old Professor this session. He has taken ill and couldn't make it.

No, it isn't serious - just a bug of some kind. I'm sure he'll be back soon. We are, however, fortunate in that one of the more gifted students will be teaching the lesson today. I spoke to him before class and the impression he gave me is that the Professor thinks quite highly of him and consults him frequently on various programming techniques. Funny, though, I talk with the Professor quite a bit and he usually informs me of his best pupils. No matter, probably an oversight on his part.

Anyway, if the gentleman in the back of the class would care to come up here now, I'm sure we're all waiting to hear what he has to say. I'd like to introduce at this time, Mr. Ron Lamon!

Thank you for the kind words, Sir. Most of you already know me anyway. The subject of today's lesson will be on line-renumbering.

Have any of you ever written a program in which you had to stick in some additional lines and had no place to put them? A program such as the following demonstrates this:

```
20 PRINT "WHAT IS YOUR NAME?"
21 PRINT "HELLO, ";A$;"."
```

We have to put in an INPUT statement between lines 20 and 21 in order to get this program to work. We can, of course, edit line 20 and change the line number to 19 or we can edit line 21 and change the line number to 22. In either case we will then have 2 lines with the same information. For our example, let's edit line 21 to 22. Enter LIST 21, press SHIFT and the <1> key and the line will be ready for editing.

Delete the <1> in <21> and replace it with a <2> and press enter. Your program should now look like this:

```
20 PRINT "WHAT IS YOUR NAME?"
21 PRINT "HELLO, ";A$;"."
22 PRINT "HELLO, ";A$;"."
```

Now enter the line:

```
21 INPUT A$
```

The program listing should now look like this:

```
20 PRINT "WHAT IS YOUR NAME?"
21 INPUT A$
22 PRINT "HELLO, ";A$;"."
```

This is the technique most of us are familiar with. However, when you have a long program that you have packed a lot of extra lines into, problems can arise. The following versions will allow you to renumber the first 4 lines of the program:

VERSION #A

```
1 GOTO 2
2 GOTO 3
3 GOTO 4
```

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- Full-size contoured keyboard
- Sturdy aluminum chassis
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3m/c sub-routines explained for the beginner.
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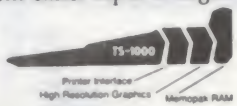

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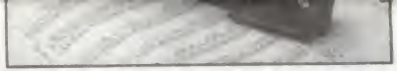

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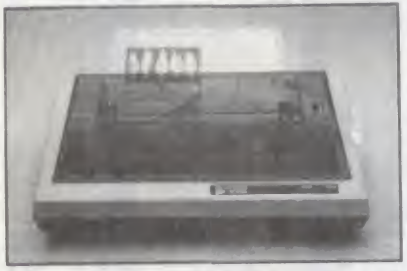

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Just a few of our widely acclaimed products for the TS1000/ZX81.

Z-99 COMPILER *03-5201* *$19.95*

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ACCOUNTS *03-1022* *$19.95*

Accounts is a simple to use, extremely versatile program for the 16K ZX81. The main feature of the program is a 200 record transaction file which can be searched, printed on displayed. The program has been thoroughly tested and used in the authors household for 10 months and this long gestation period has resulted in many refinements not usually found in programs of this type.

WORDFIX *03-1046* *$19.95*

Effectevely a mini word processor. It allows you to input unformatted text and to process it into any format you like. The results can then either be printed out or stored. (23 pages of text can be stored if required).

GRAFIX *03-6005* *$14.95*

*The **only** way to produce complex images. Superbly easy to use. When your design is complete it can easily be incorporated into other programs if desired. Images can be stored & recalled at any time, reflected (ie a mirror image),or mixed together. You can change the 'color' & produce inverse at the touch of a key. Simply the most flexible image processor available.*

COMPOSER *03-3012* *$19.95*

Actually write your own tunes in standard notation and your ZX81/TS1000 plays them! You specify tempo, rhythm, note duration and pitch (within a range of six octaves). The computer plays it back through the TV speaker, an AM radio, or your cassette recorder.

GRAND PRIX *03-4033* *$14.95*

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Here's your chance to take on Wall Street. Prices are affected by trade slumps, take over bids, recessions, etc. An exiting and challanging game for one or two players.

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Disaster has struck a giant skyscraper and you must rescue the occupants before they fall to their deaths.

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Kopak's "Touch-A-Matic" vinyl keyboard overlay gives you the power to type more accurately and much faster. It requires no wires, no soldering, and comes with complete instructions. Just remove the adhesive backing, press into position, and you're ready for touch-typing with ease. *01-0007* *$9.95*

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over $50.00 add $4.25

```
   4 GOTO 9979
9979 PRINT "START? ";
9980 INPUT A
9981 PRINT A
9982 PRINT "STEP?  ";
9983 INPUT B
9984 PRINT B
9985 FAST
9986 LET N=16508
9987 IF PEEK (N+1)=38 AND PEEK
     (N+2)=251 THEN GOTO 9997
9988 LET Y=INT (A/256)
9989 LET Z=A-(Y*256)
9990 POKE (N+1),Y
9991 POKE (N+2),Z
9992 LET N=N+1
9993 IF PEEK N=118 THEN GOTO 9995
9994 GOTO 9992
9995 LET A=A+B
9996 GOTO 9987
9997 CLS
9998 SLOW
9999 LIST
```

This routine (in this version) takes 330 bytes of memory space, not counting the first 4 lines which are the program we want to be renumbered.

Enter and RUN this program. START? is asking you for the line number you want the program to start at. STEP? is asking you for the increment number between lines. You will notice that the first 4 lines are incremented by 1 and start with line number 1. Enter 10 for the first prompt and 10 for the second prompt.

In a second or two, you will see the new listing of the program with the first line being 10 and the first 4 lines being incremented by 10.

But what has happened to the GOTO commands in the first 4 lines? The line numbers that follow them are the same as they were. What this routine does is to search the computer's memory locations for line numbers and replace them with the numbers we want and ignore the actual routine which starts at 9979. The user will have to edit any lines that use commands to branch to other line numbers with the new line numbers. The commands that branch are GOTO, GOSUB, LIST and RUN.

To renumber the first 4 lines again, you can't just type in RUN. The first line 10, will tell the program to GOTO 1, which then looks for line 1. It doesn't find it so it looks for the next line number, which is 10 and the cycle is repeated. This is a continuous loop. To execute the routine, it is better to enter GOTO 9979 or RUN 9979.

The reason that the routine doesn't renumber itself is because line 9987 allows the routine to be ignored. The mathematical formula involved in that line, calculates 38 * 256 + 251 which equals 9979. This is the first line of the renumbering routine. When the renumbering routine encounters the line 9979, the program is instructed to break out to line 9997, which ends the program.

Here is another routine that trims off some of the "fat" to save key-entry time and memory space:

VERSION B - 263 bytes

```
1 REM A
2 REM B
3 REM C
4 REM D
9986 INPUT A
9987 INPUT B
9988 FAST
9989 LET N=16508
9990 IF PEEK (N+1)=39 AND PEEK
     (N+2)=2 THEN STOP
9991 LET Y=INT (A/256)
9992 LET Z=A-(Y*256)
9993 POKE (N+1),Y
9994 POKE (N+2),Z
9995 LET N=N+1
9996 IF PEEK N=118 THEN GOTO 9998
9997 GOTO 9995
9998 LET A=A+B
9999 GOTO 9990
```

The first prompt is the starting number and the second is the increment number.

Still another:

VERSION C - 248 bytes

```
1 REM A
2 REM B
3 REM C
4 REM D
9986 INPUT A
9987 INPUT B
9988 FAST
9989 LET N=16508
9990 IF PEEK (N+1)=39 AND PEEK
     (N+2)=2 THEN STOP
9991 LET Y=INT (A/256)
9992 LET Z=A-(Y*256)
9993 POKE (N+1),Y
9994 POKE (N+2),Z
9995 LET N=N+1
9996 IF PEEK N=118 THEN GOTO 9998
9997 GOTO 9995
9998 LET A=A+B
9999 GOTO 9990
```

The first prompt is the starting number and the second is the increment number.

Still another:

VERSION C - 248 bytes

```
   1 REM A
   2 REM B
   3 REM C
   4 REM D
9986 INPUT A
9987 INPUT B
9988 FAST
9989 LET N=16508
9990 IF PEEK (N+VAL "1")=32 AND
PEEK (N+VAL "2")=2 THEN STOP
9991 LET Y=INT (A/256)
9992 LET Z=A-(Y*256)
9993 POKE (N+VAL "1"),Y
9994 POKE (N+VAL "2"),Z
9995 LET N=N+1
9996 IF PEEK N=118 THEN GOTO 9998
9997 GOTO 9995
9998 LET A=A+B
9999 GOTO 9990
```

This version may take a few more keystrokes because of the VAL expression but it saves a few bytes of memory because number values require more memory space.

The Old Professor entrusted with me this final version:

VERSION D

```
   1 REM A
   2 REM B
   3 REM C
   4 REM D
9986 STOP
9987 PRINT "WHAT IS THE STARTING
 LINE NUMBERYOU WANT?"
9988 INPUT S
9989 PRINT ,,"WHAT IS THE INCREM
ENT NUMBER?"
9990 INPUT I
9991 LET A=16509
9992 LET B=S
9993 POKE A,INT (B/256)
9994 POKE A+1,B-256*INT (B/256)
9995 LET B=B+I
9996 LET A=A+1
9997 IF 256*PEEK A+PEEK (A+1)=99
86 THEN STOP
9998 IF PEEK (A-1)=118 THEN GOTO
 9993
9999 GOTO 9996
```

This version, of course, isn't as good as mine but it does the job. It is executed by entering GOTO 9987.

I would suggest that anyone writing a program might want to save one of these versions on tape and recall it when needed and write the program with the routine as a part. Make sure that if the program ends with the last program line where it would continue into the renumbering routine, that a STOP line is inserted properly.

If you are in the miidle of writing a program and have no more space to insert lines, then you can just type in one of these routines and execute it as outlined.

Well, since there is another half hour to the class, I suggest all of you practice what I've taught while I go back to my seat and sleep.

You can't buy beer!
You can only rent it.

- Archie Bunker

The SYNTEXT WORD PROCESSOR

A word processing program written by Gene Buza

If you liked BABY SYNTEXT, you'll love its big brother. SYNTEXT has all the features of the little guy plus some additional. They are:

A. Insertion of 32 blank character lines
B. Deletion of 32 character lines
C. Formatted print-out capabilities

MASS INSERTION/DELETION

With the baby version, if you want to insert another paragraph into the text, you have to hold the SHIFT I keys until you have enough room for the insertion. SHIFT E works the same way but instead of one blank space, thirty two (one line) are inserted. SHIFT D in BABY SYNTEXT deletes one character to the right of the cursor. With SYNTEXT, SHIFT F deletes 32 characters (one line).

TEXT ENTRY RULES

The best feature of SYNTEXT, however, is its formatted printout capabilities. The program has the unique capability of automatically formatting paragraphs.

A. When the first paragraph is started in text, it should be indented three spaces.

B. When that paragraph is ended and the next one is to be started, separate the last character of the first paragraph with two empty spaces and then start the next paragraph.

C. Do not, and I repeat DO NOT format the text on the screen. Let the words wraparound from end-of-line to beginning of line. If you do screen format, the printout will be incorrect.

To enter the print out mode, press SHIFT A.

This allows the user to print the text through the printer. It has been tested by us with the Sinclair ZX printer, the Mindware MW-100 printer, the Timex 2040 printer and the Siekosha GP-100A printer. The 2040 printer, in our opinion, represents the best value and should be available from almost any Timex outlet with extra paper. For more professional results, an impact dot-matrix printer such as the GP-100A can be used.

FORMATTING PRINTOUT

After SHIFT <A> has been pressed, THERE WILL BE A PAUSE. Do not be alarmed. What is happening is that a routine is determining where the last character of your text is located in the text string. The entire text is in the single string variable, <A$>. If no text is in the string, it will take about 60 seconds for the routine to time out. If you have used the entire 88 lines, it will time out almost instantly. In other words, the more text you have, the shorter the pause time. This is because the length of the string <A$> is always 2880

characters in length and the routine starts counting from the end toward the beginning, looking for the last character in the text (pretty sneaky).

After the pause, the following prompts will be displayed:

- HOW MANY CHARACTERS PER LINE?

This asks the user what the maximum length of a printed line should be. Keep in mind, if your printer prints a maximum of 16, 32, 40 or 80 columns, the number you enter cannot exceed this amount. If it does, overflow to the next line or some other dire circumstance may occur.

- LEFT MARGIN SPACES?

The user is then asked how many blank spaces are to be put at the beginning of each line. Again, the user is cautioned that the number entered here when added to the previously entered number cannot exceed the total column printout capability of the printer used. For some reason, the GP-100A will not allow this total to exceed 64, even though it is an 80 column printer. When 64 is exceeded, blank lines are interjected between each printed line.

- RIGHT MARGIN JUSTIFY?

The user is given the option of having the last characters of each fully printed line, line up with each other or not having this condition. Answer with <Y> or <N>.

- NUMBER OF LINES PER PAGE?

This prompt is mostly for those who have tractor/pin-feed printers that use the fan-fold paper. This prompt, along with the next, allows the text to be printed in blocks with blank lines skipping over the connecting perforations of the paper. For most dot-matrix printers, the paper allows 66 lines on an 8 1/2 by 11 inch sheet. The number <60> for this prompt and <6> for the next prompt is usually sufficient.

If you have a thermal or friction printer with a continuous roll of paper, enter <120> or some number that exceeds the amount of lines your text has and you'll be OK.

- NUMBER OF LINES BETWEEN PAGES?

Again, this is for page spacing. If you have a tractor feed printer, experiment to find the proper number needed. With a roll paper printer, any number will do since it is ignored when the previous number is high enough.

The user is encouraged to experiment with different format settings, no matter what kind of printer is used.

- MAKING DUPLICATE COPIES

After the text is printed, the text returns to the screen with the blinking cursor. To make another copy, simply press the BREAK key and type <GOTO 4150>. Adjust the printer paper and press the ENTER key and the text will be printed again with the same format

Some useful hints are:

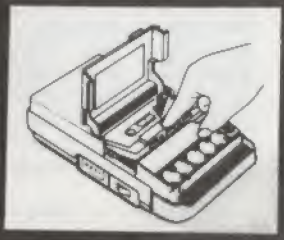
- if you want to insert a block of text in existing text, use the SHIFT (E) command to create a gap large enough for the block to be inserted. The task of deleting the remaining uneeded blank spaces after the text is inserted can be accomplished by using the SHIFT (D) and/or SHIFT (E) keys.

- if you want to replace a character with a blank space, the SHIFT RIGHT ARROW won't do it. First delete the character and then insert a blank space.

This program can be purchased from us with complete documentation as package #0006 for 14.95 or with four other routines and the MINI-PRO word processor as BOSS package #107 for 19.95. See the enclosed order sheet.

* If you want package #0006 for 14.95, you'll have to write it on the order sheet because it isn't listed yet but it is available.

OVERCOMING CASSETTE LOADING and SAVING PROBLEMS



This is the fourth article we have had on this subject. We still receive many calls and letters about various SAVE/LOAD problems.

One of the most common is that an individual orders a tape from an outside source, whether it be us or some other Software House, and can't load it into the computer. The identical phrase is used by almost all of these people:

"This tape won't load at all. None of the programs on either side can be loaded into the computer. I know it's not my tape recorder because I can save and load programs I entered myself and they work just fine".

Well, I have discovered that, in many cases, it is the tape recorder that is the culprit. "How can this be", you say?

Simple; the RECORDING HEAD IS OUT OF ALIGNMENT. The head is saving the program off-track and when it is re-loaded it is re-loaded off-track. Programs that are saved with professional recording equipment record the pulse in proper track alignment - - - most of the time.

This problem of the head being out of alignment is a lot more common than I thought. Sometimes it can be corrected by an adjustment, as outlined in the owner's manual. On the CTR recorders that I have, there is no adjustment that I am aware of and I have to take the recorders to a service center.

We personally use the DIGITALIZER equipment (see this month's EDITOR RAMBLINGS) along with the new Radio Shack CTR-81 recorders.

If you feel your recorder might be recording off-track, use another recorder (borrow a friend's if necessary). Try loading programs you made yourself and then the commercially prepared programs.

If you are in the market for a new recorder, I recommend either the General Electric 3-5158 Computer Tape recorder (51.95 retail, usually cheaper) or any of the Radio Shack CTR computer recorders (CTR-41 - 49.95, CTR-80 - 59.95, CTR-80A - 59.95, CTR-81 - 59.95, the CTR-81 is their current model).

For a real bargin, contact your Radio Shack Computer Center and ask them if they have any rebuilt CTR computer recorders. You can usually get them for about half price but many of the smaller population center areas may not have any available.

However, if the problem cause isn't the recorder, disconnect the EAR plug from the recorder jack and listen to the program pulses. Try to hear any of the following:

- DROPOUTS - these are sudden drops in volume that can cause the program to bomb, the result usually being the return of the <K> cursor. They may be caused by the tape becoming stretched. If there is a lack of magnetic particles in any part of the tape, dropouts can occur. Demagnetizing the tape with a bulk eraser before recording on it can sometimes help. Dropouts can somtimes be overcome by increasing the volume adjustment of the recorder. A trick I have used, that

sometimes works, is to locate the dropout location by noting the position of the number counter. I load the tape again and when the tape approaches that position, I increase the volume on the recorder and then decrease it when that position is safely passed.

- WAVERING - this is the effect where the volume of the sound pulse pattern keeps cycling from high to low in a constant manner. At the high point, the program might blow. At the low point, data may be lost to the computer. Volume adjustment sometimes overcomes this effect but in extreme cases, nothing helps except if a device, such as the Winky Board (G. Russell Electonics - BULLETIN BOARD on cassette this month), is used. This problem is caused by either a bad recorder or a bad tape.

- DISTORTION - extra noise on the tape interferes with the computer's ability to identify the program pulses. This may be leftover strong pulses if the program was recorded over an old program. Again, de-magnetizing or a device like the Winky Board can help.

- UNEVEN PULSE RATES - this can usually be traced to a problem with the recorder's drive mechanism. The belts may be slipping or the motor may be binding. Consult the recorder manual for proper lubrication and cleaning procedures. If belts receive a coating of lubricant, all sorts of problems can arise. Belts can enlarge as they get old and may have to be replaced. Sometimes they just keep falling off the drive wheels.

- EXTREMELY HIGH VOLUME - the result of this is usually the screen going blank with no cursor. This is usually easy to remedy just by turning down the volume except if there is some other kind of distortion, also.

Sometimes, the head of the recorder itself becomes magnetized or dirty. It is usually a simple procedure to clean or demagnetize the recorder head. Most vendors of cassette recorders sell tape cleaning & demagnetizing devices.

* If you have trouble SAVEing programs, I might suggest:

- MAKE SURE THE PROGRAM IS NEVER SAVED AT THE BEGINNING OF THE TAPE. You have no idea how many times people have tried to save a program before advancing the tape beyond the leader. All tapes (except leaderless tapes) have a segment at the beginning and end of the tape made of a plastic material that have no magnetic particles in it. These segments are designed to affix the magnetic tape to the two spools. They cannot hold and data themselves.

- disconnect the plug from the recorder EAR jack while recording. The recorder may pick up unwanted noise from the computer through this circuit.

- use quality cassettes. They don't have to be expensive and some expensive tapes are less suited for storing computer frequency pulses.

- run the recorder on batteries instead of AC. The AC power source into the recorder may introduce voltage spikes or hum that shows up as distortion in the recorded program pulses. Some recorders may have a problem keeping the drive motor operating at a constant RPM when on DC current, so make sure the batteries are fresh.

- find out if there is an extreme amount of noise that accompanies the program when the RAMpack is attached and a program is saved, as compared to saving a program with the RAMpack un-attached. If there is more noise, consider obtaining another RAMpack. Our experience has shown the Memotech RAMpack to be less noise-producing than most.

- in extreme cases, run the computer on batteries when saving a program. This involves building a power supply with batteries. Make sure

that proper polarity is observed. The power plug tip should be positive that comes from the battery pack and goes into the computer. IMPROPER POLARITY CAN CAUSE DAMAGE TO THE COMPUTER. If you have any doubts, ask someone who has some expertise in this area. I built such a device with NiCad rechargeable batteries inside of a metal case with an input jack for the computer's power supply which is used to charge the batteries - on/off switch, output plug on a 2-wire cord for the computer and DC meter to check the power status of the batteries. The whole thing cost me less than $30.00 and I bought all the parts from Radio Shack. Another alternative to the battery pack is a filtered power supply for the computer 9VDC power supply. Radio Shack (I'm beginning to sound like a commercial) sells one - part #15-1110 for 6.95.

* If you have trouble LOADing programs:

- disconnect the plug from the recorder MIC jack while loading.

- if the recorder has a treble/bass adjustment, the treble should be at maximum level and bass at minimum.

- if the recorder has a high/low switch it should be at high.

- the volume adjustment, if set at 75% maximum, is usually the best setting.

- run the recorder on batteries.

I don't suggest you try all these things at once but one at a time until whatever problem you have is overcome.

PROPER VOLUME SETTING ON RECORDER.

One method I have found for getting the proper volume setting for any 16K program which I wrote about in our July/82 issue. I will review it again here because it bears repeating. But a 16K program (use one, if you have it, that doesn't have any data recorded in it, such as a file or word-processing program) into the recorder and follow the following steps:

A. type in LOAD "XXX" but don't ENTER it yet.

B. turn the volume of the TV up so that you can hear the audio pulses of the tape.

C. press ENTER on the computer.

D. press PLAY on the recorder.

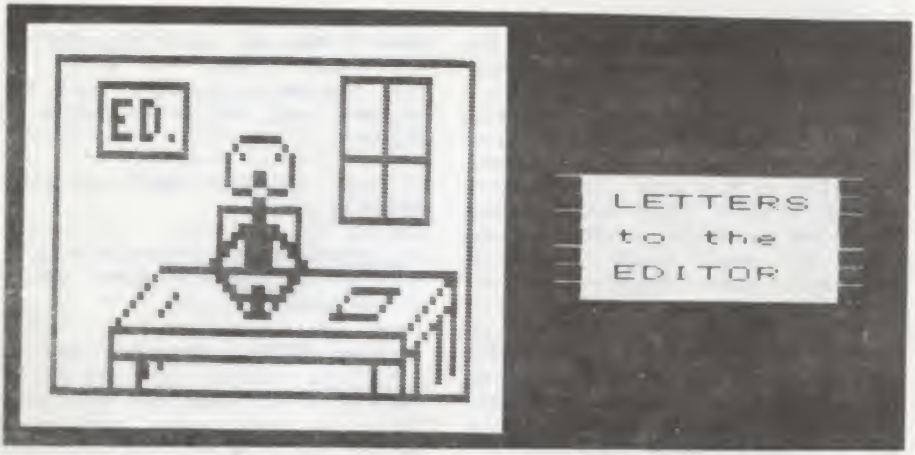
E. let the program feed into the computer until you can hear the even-sounding pulses. It should occur at the end of the program and have 24 pulses that last 17 seconds.

F. if you have a tape counter, note the location where these pulses begin and end. You are going to have to probably return to this segment a few times with the recorder's FAST FORWARD and REWIND keys. Do not worry about the program bombing while you are stopping, rewinding and restarting the recorder. The computer is searching in vain for the program "XXX" and will not bomb.

G. when you are comfortable with finding the locations of the pulses, advance the tape to the point where the pulses begin. There should be 5 horizontal bars that are relatively steady. This situation will only last for 17 seconds. Before these pulses, the bars did a lot of jumping around. You are now going to adjust these bars so that the edges have very stright and clean edges.

H. start turning the volume up on the recorder until the bars start getting fuzzy edges. If you turn the volume too high, the bars may get wider and wider until there's very little white left on the screen. When the fuzzy edges occur, stop and turn the volume down again until the edges become crisp and straight again.

(cont. page 11)



Dear Ed,

First, let me express my appreciation for SYNCHRO-SETTE. The more I re-read them and experiment with the programs that you have prepared, the more I learn about my ZX-81.

In the November, 1982 issue (Vol.1, No. 8) on the back page, you included the program "DATES, PAST, PRESENT & FUTURE". Then the very last comment was: "It is not that hard to use this routine to put a calendar on the screen for any month." So I thought that I would give a try to turning it into an appointments calendar ... With the addition of several program lines, I was able to make an adjustment for varying the lengths of the months:

```
Lines 10-140  the same as printed
        150 PRINT "ENTER THE DATE"
        160 INPUT D
        170 IF D=0 OR D=32 THEN
            GOTO 600
        171 IF D=30 AND (M=4 OR M
            =6 OR M=9 OR M=11)
            THEN GOTO 600
        172 IF D=29 AND M=2 THEN
            GOTO 500
        173 IF D=30 AND M=2 THEN
            GOTO 600
Lines 180 to 320 same as printed
        500  IF   INT   (Y/4)=(Y/4)
             GOTO 173
        600 PRINT "INVALID DATE"
        605 PAUSE 200
        610 CLS
        620 GOTO 90
```

Now perhaps you will help with a tutorial that will show us how to develop an appointment book.

Another area that would interest me comes from a Beginners' Course in programming that I had in San Salvador on an Ohio Scientific. They had a cassette program that poked the screen display from 24 characters to the line to 48. Would it be possible to develop a program for the ZX-81 that would increase the screen display from 32 to 64 characters per line?

When I first returned to the U.S. and found my ZX-81 waiting for me, I was a little bit disappointed. It seemed little more than a toy. But the most valuable peripheral that I have for my ZX is SYNCHRO-SETTE, THANKS!!!

Just as I was about to put the letter into the envelope, I thought of one more area where I could use a little help.

The Gladstone keyboard has six extra "user definable keys". How can

they be designated? Do they have to be hard-wired for a task or can they be programmed from the keyboard? It would be helpful if there was someway to put a shift key on the right side of the board to get to those upper case left hand keys.

Sincerely,

Jack H. Lottey
Director of Resources Development
Upstate Home For Children, Inc.
Oneonta, NY

Dear Jack,

I'm sure many of the users will find your program change helpful. I got this routine from a much more elaborate program I wrote on another computer for sales analysis. Here's how it works: It looks at a file of customer receipts for only two items, the date and the sales amount. It then draws a calendar month, knowing exactly when the first day of the month occurs and how many days there are in the month. It then puts into each day's box the total number of sales and the total dollar amount. Therefore, 12 sales for $475 would be represented as 12/475. It shows at the end of the week the total sales/total dollar amount at the right of each row and does the same for the the columns of days at the bottom of each column. It then shows the total sales amounts and the average sale.

This is just one of the ways this routine can be used. You can expect to see a version on one of the future cassettes (mabe even June/83).

Appointment book calendars are much simpler and I may have one of those, too.

To generate more and smaller characters would require a ROM change or enhancement. The character generator in the ZX/TS computers only allows the ones you see from the keys. The reverse is possible where larger characters are generated, like in our SUPERSCROLL and INVERSCROLL programs. If one of the high resolution modules such as the HGR EPROM (99.95 from Memotech 800/662-0949) is added, it might be possible to write a program that generates smaller characters, because instead of having screen resolution of 64 by 44 pixels, you would then have 192 by 248 pixel resolution.

The "user definable keys" on the Gladstone keyboard, to the best of my knowledge, are defined by soldering their leads into the computer circuitry to accomplish what you define. I'm, of course, being facetious. There are many hackers out there who find this child's play. I'll stick to programming.

Some suggestions for the keys, besides what you suggested, might be - shift lock, power on/off (like the 2040 printer), instant USR calls such as sort routines or memory size check (ROM module interface needed), LIST, LIST scroll up, LIST scroll down, CONT of program with restoration of screen graphics and character that at present, are lost forever, etc.

I'm sure most of these features would need ROM modification or addition of some ROM module - Ed.

Dear Ed,

I have received two issues of SYNCHRO-SETTE so far and I want to congratulate you all on a powerful little magazine.

You have probably had an article on this application, but I'll ask anyway - I would like to see how to write a program to add undetermined columns of figures from INPUTS and display (with totals and averages) on the monitor.

I would also like to see more descriptions on the BOSS program packages to determine if they would fit my applications. (Don't buy a pig in a POKE - would like more of a

PEEK at the pig first).

Keep up the good work.

Respectfully,
John P. Baney, Perrysville, OH

Dear John,

VAL told me she wanted a TAB COS she was ON a diet AND wanted TO slim down AND get a TAN NEXT summer AND GOTO her CONTry estate. (See, two can play that game and I think it's a SIN.)

Ask and ye shall receive!

```
10 DIM A(100)
20 LET B=0
30 LET C=0
40 LET B=B+1
50 INPUT A(B)
60 SCROLL
70 LET C=C+A(B)
80 PRINT B;TAB 10;A(B); TAB 20;
   C/B
90 GOTO 40
```

RUN this program and enter your numbers. The increment will be the number in the first column, the entered number will be in the second column and the running average will be in the third coulumn.

We intend to do reviews in future issues of other BOSS software packages like the SYNTEXT review in this month's issue - Ed.

One of our subscribers wrote in asking how to find roots of any value for any number. I can't seem to find the letter but the reference was on how to find roots of a number. The following format program was similar to the method described in the letter to find powers of a number:

```
10 PRINT "WHAT IS THE NUMBER?"
20 INPUT A
30 PRINT "WHAT IS THE POWER?"
40 INPUT B
50 PRINT A; " TO THE ";B;
   " POWER IS ";A**B
```

To find roots of a number, the following program will accomplish this task:

```
10 PRINT "WHAT IS THE NUMBER?"
20 INPUT A
30 PRINT "WHAT IS THE ROOT?"
40 INPUT B
50 PRINT A; " TO THE ROOT OF ";B;
   " IS ";A**(1/B)                Ed.
```

(2040 REVIEW CONT.)
looking, but more so than handwriting.

The biggest headache of most programmers is trying to visualize a program listing to remember where various routines are located. Problem solved - LLIST lists the program to the printer exactly as you see it on the screen but in its entirety.

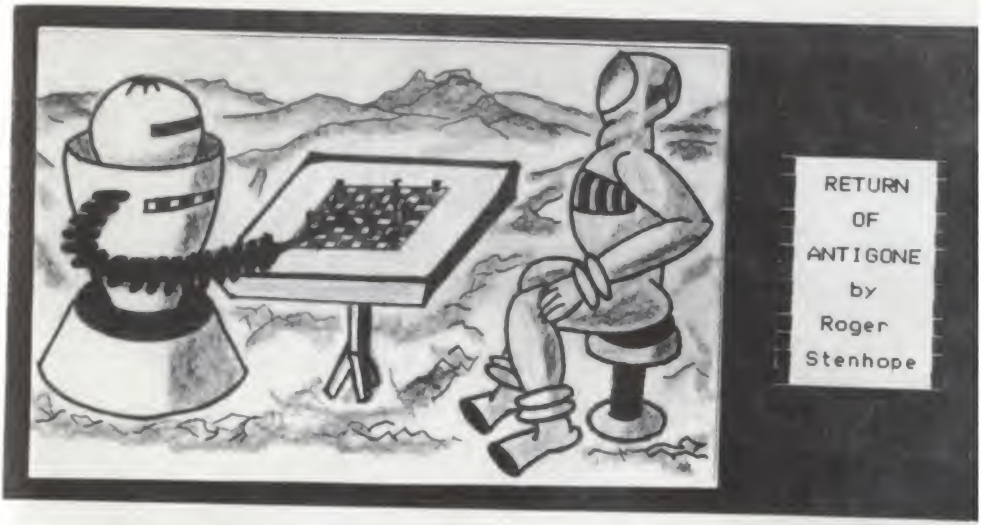
The only problems we are aware of at this time are:

- trying to locate additional paper supply sources. In the Chicago area, the Venture chain stores have just started selling it. The paper price is very reasonable, too, with three 82 foot rolls selling for only 5.95. TRS-80 thermal printer paper was around $15 for 3 rolls and is grey. Stores all over that sell the printer should soon have a good supply of the paper.

- a subscriber called to let us know that the printer becomes in-operative when the Byte-Back telephone modem is connected. This, of course, makes it impossible to get hard copy from the Networks through your phone.

We have used this printer with some programs such as the SYNTEXT word processor (see SYNTEXT review this issue), the ARTIST program (BOSS PKG #116) and PAINT BRUSH (this issue cassette) with striking results. The cover of the magazine shows some samples.

The combination of easy-to-read print-out, sturdiness, quietness and speed make this printer an excellent buy.



RETURN OF ANTIGONE

by Roger Stenhope

"Mate in 22"! Dead silence. Then the LEDs flashed on Proctor's faceplate intermittently. Five or six minutes passed.

"Are you Sure"? Seventeen plys had been searched. No advantage could be seen.

"I'm sure"! Patrian rose and stretched his muscles. The glow could still be seen from the ravine.

Proctor locked in. The LEDs flashed a steady stream. Now and then the LEDs would flash intermitenttly. Six hours at least, according to Patrian's computations. Patrian left. He slowly made his way across the craggy frontier toward the ravine. Gravity was cheap - he had to be careful. The obstacles lurked in ominous seclusion. Five minutes at most even at the necessary slow pace.

The glow grew brighter. He entered the channel at the bottom of the ravine and cautiously approached the mirror. A million glittering stars awaited.

Patrian stood before the mirror. Minutes passed. With extreme caution, he extended his hand. The glittering stars spiraled around the protrusion up to the elbow. It felt wet. He quickly withdrew his hand.

No change. Apparently not a dangerous act. Patrian stepped through.

Bells clanged! Swanson's eyes opened. Multi-coloured lights flooded the enclosure. Already the check-points were being alerted. "What's going on down there"? Swanson shook the grogginess from his head. He willed the volume down and checked the read-outs.

"Sector 397xb! Life form! Undertermined metab status"! He heard himself rattling off statistics. BB7 entered from the enclosure's South entry screen, his face a showing obvious irritation.

"Sleeping again, Swanson"? He headed for the data terminal. A code was punched. The CRT jumped to life. Biped humanoid - - advanced biochip metabolism - - thirtyish - - caucgenes - - low-nourished - - descended heart-rate - - enhanced numbercrunch brain-enhance. Weight, height and other vital statistics poured onto the thermal printer.

"Call processing. Tell em we got a live one. I'm jumping the shuttle now. It's in the E quadrent by the Mars belt. I didn't know we had a unit in the belt! Call my wife and tell her I'll be late for dinner".

Edith put the vacumn away and answered the persistant knocking at the door. Two uniformed police stood blocking the dusk. "Mrs. Taylor? Mrs. Marcus Taylor"?

Edith studied the neatly dressed policewoman for a moment, too startled to respond. "Yes? I mean, yes, I'm Mrs. Taylor! What is it"?

"Is your husband here"?

"He's resting now. He wasn't feeling too well. Is there something I can do"?

"I'm afraid you'll have to wake him. He has to appear at the Incar Center".

"Why? What has he done"?

"Please, Mrs. Taylor. You may accompany him if you wish. It will all be explained at the Center".

Patrian stood in a booth. Except, there was no booth. At least no walls his sensors could perceive. His body could only move so far and would run against a barrier. Outside the booth, humanoids. Like himself. Patrian had never seen another humanoid. His memory banks confirmed identification.

EB7 moved toward the force field. "Any antag emanations"? "None - quite peaceful, actually! Just a little anxiety" the synthesiser droned. Swanson sat sheepishly, afraid to voice any opinion.

"Shut it off, then". A loud snap told EB7 that he was on his own now. "Do you hear me? Can you understand me"?

Patrian heard noises through the vestigal organs. Pain at first and finally a dull ache that subsided. The noises formed a pattern that triggered deep, long-forgotten memories. The protective blanket was gone. He didn't need it. An entire cubicle with atmosphere. Patrian stood in awe!

EB7 turned roughly toward the synthesiser. "Does he hear me"?

"He hears you - but his chips are not conditioned to spoken language. A seldom used circuit is taking time to respond. He should understand in a few seconds. It may be a while before communication. He is shocked".

Patrian examined the data flow. His circuits seemed to burn information into his head. He grasped his ears. The pain started again and stopped. It was clear.

"What - I - I don't understand"!

"Take it easy, old timer. Here, sit down". EB7 pulled up a chair. A carafe appeared at the portal from the synthesiser. EB7 motioned Swanson to fetch it.

"It should contain the nutrients for stimulation" the mechanical voice droned again.

Patrian slipped into the chair and accepted the liquid. It tasted cool and sweet. His head started to clear. Eyes focused on the two bipeds - and then at the machine. It looked like Proctor. Had he followed him through the mirror? Impossible! The problem had dedicated his circuits. This one seemed a little larger, anyway.

Moments passed! Patrian studied the surroundings, oblivious to the man questioning him.

"He's not responding. Scan his circuits"!

The synthesiser beam-projected the humanoid.

Patrian felt needles enter his brain. The automatic defense system activated the prism electronics instantly. The input signal was amplified a millionfold and reflected back to its point of origin.

The synthesiser started to smoke!

To be continued ...

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